

Introduction to Demand Resources in New England's Forward Capacity Market

**Cleaner Technology and Energy Efficiency:
Structuring a Competitive Advantage Conference**

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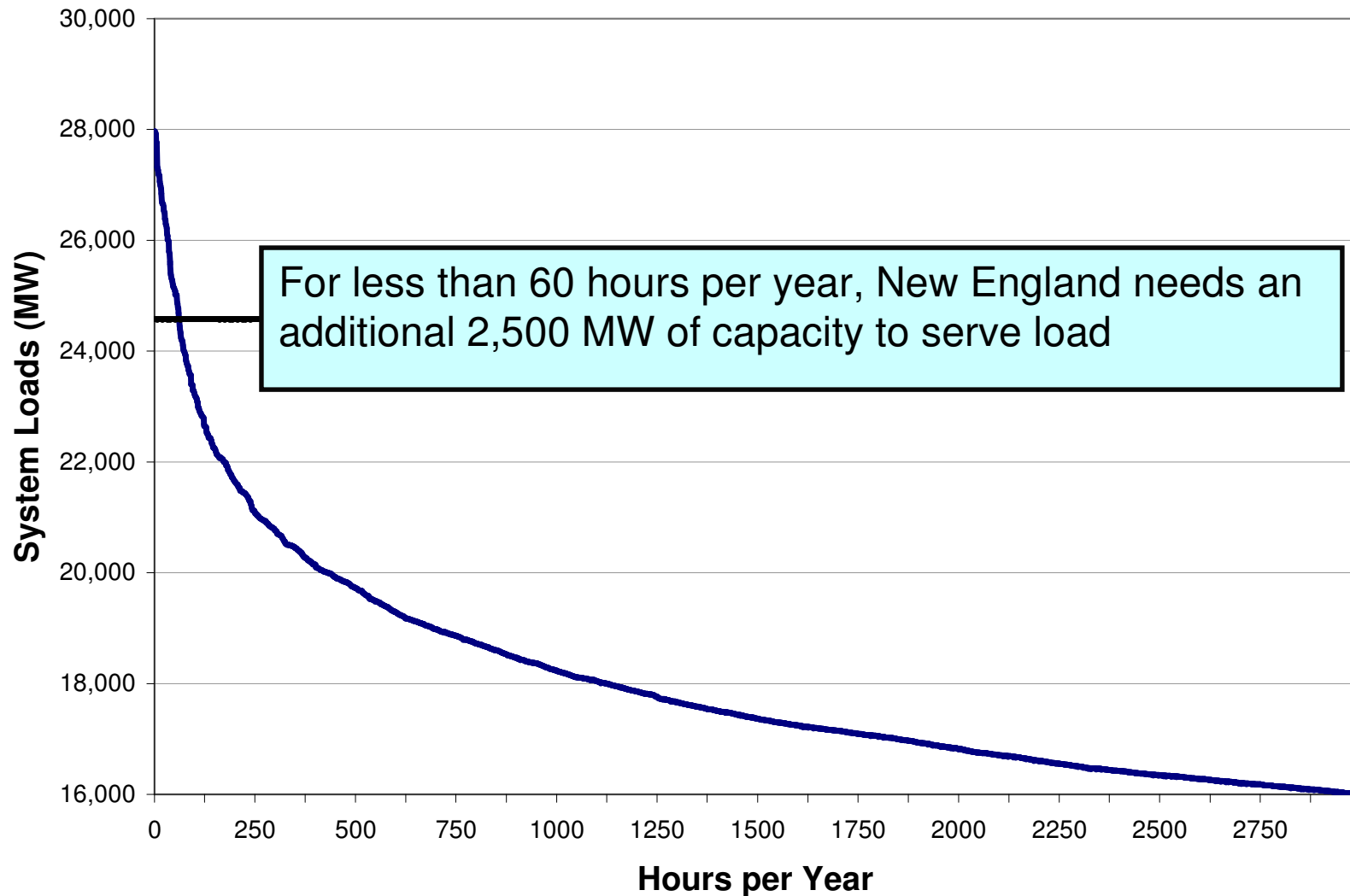
- ISO New England is a regional transmission organization (RTO), serving Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.
- Minute-to-minute **reliable operation** of New England's bulk electric power system.
- Development, oversight and fair **administration of New England's wholesale electricity marketplace**, through which bulk electric power has been bought, sold and traded since 1999.
- Management of comprehensive **bulk electric power system and wholesale markets' planning processes** that address New England's electricity needs well into the future.

Forward Capacity Market Background

- The Forward Capacity Market (FCM) will be used to procure capacity to meet New England's forecasted demand and reserve requirements three years into the future.
- The FCM uses a competitive ***Forward Capacity Auction (FCA)*** process.
- New resources can receive a long-term commitment (up to 5 years). *Generation and Demand Resources* may participate in the FCM.
- Resources that clear the auction are paid the market-clearing price (\$/kW-month), subject to performance incentives and penalties.

Why Should Demand Resources Participate in the FCM?

New England Load Duration Curve (2006)



Demand Resource Performance

- The proposed rules for the FCM defines Demand Resource Types *by the way in which they reduce load*, not by technology.
- Demand Resource Types include:
 - On-Peak Demand Resources
 - Seasonal Peak Demand Resources
 - Critical Peak Demand Resources
 - Real-Time Demand Response Resources
 - Real-Time Emergency Generation Resources

Eligible Resources

- **Supply Resources**
 - Traditional Generation (Oil, Coal, Natural Gas, etc)
 - Intermittent Generation (Wind, Solar, etc.)
 - Renewable Generation
- **Demand Resources**
 - Energy Efficiency
 - Load Management
 - Distributed Generation
 - Demand Response



Eligible Participants

- Owners and Developers of Traditional Power Plants
- Electric Utilities
- Competitive Energy Suppliers
- Energy Services Companies (ESCO)
- Demand Response Providers
- Technology Providers
- Retail Customers (Willing to satisfy the same requirements as other Eligible Participants)

Forward Capacity Market – Schedule

- 1st Forward Capacity Auction scheduled to take place in **February 2008** for Capacity delivery starting **June 2010**
- New Resources interested in participating in the 1st Forward Capacity Auction must submit to ISO-NE:
 - Show of Interest Application by **February 28, 2007**
 - Qualification Package by **June 15, 2007**
- After February 2008, additional Forward Capacity Auctions and Reconfiguration Auctions will be held on a regular basis (annual, seasonal and monthly).
- **Transition Period** starts December 1, 2006 providing Capacity Payments to eligible Supply and Demand Resources through June 2010

Show of Interest Results

- ISO New England received more than 400 Show of Interest Forms from new Supply and Demand Resources totaling over **17,200 MW**
 - Over **15,000 MW** from new Supply Resources including traditional generation, renewables and imports.
 - Over **2,200 MW** from new Demand Resources including energy efficiency, load management, distributed generation and demand response

Demand Resources Show of Interest

MW by State and Resource Type

State	Resource Type					Grand Total
	Real-Time Demand Response	Real-Time Emergency Generation	Critical Peak	On Peak	Seasonal Peak	
Massachusetts	311	226	286	262	29	1,113
Connecticut	143	141	112	61	120	577
Maine	122	33	27	32	2	215
Rhode Island	68	74	9	35	4	190
New Hampshire	24	41	18	45	4	131
Vermont	17	22	8	6	1	54
Grand Total	685	536	460	440	159	2,279

80% of the proposed MWs are from non-utility suppliers such as energy services companies, third-party energy suppliers, equipment vendors and retail customers.

Source: ISO New England Press Release March 16, 2007

Transition Period

Transition Period (12/1/2006 to 5/31/2010)

- Eligible Supply and Demand Resources can earn monthly Capacity Payments.
- Resources must be registered with ISO New England.
- Resources must demonstrate demand reduction or output per an approved **Measurement & Verification Plan**.

Period	Capacity Rate
12/1/2006 to 5/31/2008	\$3.05/kW per Month
6/1/2008 to 5/31/2009	\$3.75/kW per Month
6/1/2009 to 5/31/2010	\$4.10/kw per Month

The Business Case

Making the Business Case - Revenues

- **Capacity**
 - \$/kW per Month based on Transition Payments (\$3.05/kW starting December 2006) or Forward Capacity Market clearing price (starting June 2010)
- **Energy Reduction or Output**
 - Avoided Retail or Wholesale Price (\$/kWh)
 - Demand Response Performance Payment (Currently \$0.50/kWh for 30-Minute Response)

Making the Business Case – Costs

- **Fixed Costs**
 - Equipment and Installation
 - Advanced Metering (Required for Real-Time Demand Response Programs)
 - Controls and Equipment Upgrades (Optional)
- **Variable Costs**
 - Internal and External Labor
 - Fuel and O&M
 - *Lost Opportunity Cost*

Transition Period Revenue Examples

- **General Assumptions**

- Capacity Value: 500 kW
- Transition Payment: \$3.05 to \$4.10/kW per Month
- Transition Period: 12/1/2006 to 5/31/2010 (3 ½ Years)
- Avoided Retail Electricity Rate: \$0.10/kWh

- **Real-Time Demand Response**

- Real-Time Demand Response project reduces 500 kW within 30-Minutes of ISO-NE's request. Activated 8 hours per year and paid the Floor Price of \$0.50/kWh

- **Distributed Generation/Combined Heat & Power**

- Distributed Generation project reduces 500 kW, on average, 5,000 hours per year.

Real-Time Demand Response Revenue

Capacity	500	kW
Transition Payment	3.05 - 4.10	\$/kW per Month
T&D and RM	8% and 14.4%	RM Variable
Transition Period	3.5	Years
Total Transition Payments	\$ 93,022	93%
Event Hours per Year	8	
Annual Energy Savings	4000	kWh
Payment Rate	0.50	\$/kWh
Annual Energy Payment	\$ 2,000	
Total Energy Payment	\$ 7,000	7%
Total of 3.5 Years	\$ 100,022	100%

Combined Heat & Power Revenue

Capacity	500	kW
Transition Payment	3.05 - 4.10	\$/kW per Month
T&D and RM	8% and 14.4%	Variable
Transition Period	3.5	Years
Total Transition Payments	\$ 93,022	12%
Annual Operating Hours	5000	
Annual Energy Savings	2500000	kWh
Avoided Retail Energy Rate	0.08	\$/kWh
Annual Energy Payment	\$ 200,000	
Total Energy Payment	\$ 700,000	88%
Total of 3.5 Years	\$ 793,022	100%